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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/576,990

04/26/2006

R. Andrew Hicks

DREX-1108US

4338

21302 7590 02/09/2009

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EXAMINER

VILLECCO, JOHN M

ART UNIT

PAPER NUMBER

2622

MAIL DATE

DELIVERY MODE

02/09/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/576,990	<b>Applicant(s)</b> HICKS, R. ANDREW	
	<b>Examiner</b> JOHN M. VILLECCO	<b>Art Unit</b> 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed December 5, 2008 have been fully considered but they are not persuasive.
2. More specifically applicant contends that the Stoltz reference (U.S. Patent No. 5,212,555) fails to disclose:
  - a. A micromirror capable of tilting in at least two tilt directions.
  - b. A micromirror capable of reflecting different locations of a scene to a photographic image device.
3. Regarding point a) claim 1, merely states that each mirror of the micromirror is capable of individually tilting in at least two tilt directions to reflect different sets of pixels representing locations of the scene. As mentioned in the previous office action, Stoltz discloses an embodiment (Figure 4) in which each pixel is directed towards to different image sensors. Different tilt positions are used to direct light to the two different image sensors (col. 5, lines 53-55). Furthermore, Stoltz discloses that the mirror can be tilted in the left and right (or up and down). See Figure 2B. Reference numbers 45a, 45b, and 45c, represent the different tilt directions. Therefore, each micromirror is capable of tilting in at least two directions.
4. As for point b) claim 1 requires that each mirror reflects different sets of pixels representing locations of a scene based on the tilt and that each mirror transfers a reflected pixel representing locations of the scene to the photographic imaging system. According to the embodiment shown in Figure 4, each mirror reflects pixels representing locations of a scene to

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the two image sensors. The embodiment of Figure 4 is capable of “increasing resolution for a given operating speed”. Thus, two complete images of the scene are captured and combined to increase the resolution of the image. Since the claim language merely requires the reflection of “different sets of pixels representing locations of the scene”, each mirror is only required to reflect different sets of pixels representing locations of the scene. It is clear that each mirror in the embodiment shown in Figure 4, is capable of directing different sets of pixels representing locations of the scene.

5. For the reasons stated above the rejections from the previous office action will be repeated.

6. Additionally, applicant’s amendment has necessitated the new grounds of rejections found on the following pages.

### ***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 5, 6, 17, and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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9. Regarding claim 5, applicant claims that “each micromirror may be positioned in at least 320 different positions in each said tilt direction” (emphasis added). This limitation implies that the micromirror can be controlled in more than 320 positions. The applicant pointed out page 8, lines 1-13 as providing support for this amendment. However, this section only states that each angle of the Lucent Lambdarouter is estimated to be able to be controllable for 320 states. There is no disclosure that it is capable of being controlled in more than 320 states. Therefore, this limitation constitutes new matter.

10. As for claim 6, applicant claims that “each micromirror can be oriented in any of at least 100,000 positional states” (emphasis added). This limitation implies that the micromirror can be oriented in more than 100,000 positional states. The applicant pointed out page 8, lines 1-13 as providing support for this amendment. Additionally, page 9, lines 1-2 provide additional support. However, these sections only state that there are exactly 100,000 positional states. There is no disclosure that there are more than 100,000 positional states. Therefore, this limitation constitutes new matter.

11. With regard to claim 17, applicant claims that “steps (a)-(c) are repeated at least 70 times” (emphasis added). This limitation implies the image sensor is capable of capturing at least 70 frames. The applicant pointed out page 5, lines 23-25 as providing support for this amendment. However, this section only states that exactly 70 images are taken. There is no disclosure that there are more than 70 images taken. Therefore, this limitation constitutes new matter.

12. Regarding claim 18, applicant claims that “steps (a)-(c) are repeated at least 100,000 times” (emphasis added). This limitation implies that the micromirror can be oriented in more

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than 100,000 positional states. The applicant pointed out page 8, lines 1-13 as providing support for this amendment. Additionally, page 9, lines 1-2 provide additional support. However, these sections only state that there are exactly 100,000 positional states. There is no disclosure that there are more than 100,000 positional states. Therefore, this limitation constitutes new matter.

### ***Claim Rejections - 35 USC § 102***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**14. Claims 1-4 and 7-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Stoltz (U.S. Patent No. 5,212,555).**

15. Regarding *claim 1*, Stoltz discloses an image capturing device which uses a DMD (deformable mirror device) comprised of a number of individually addressable micromirror devices. More specifically and as it relates to the applicant's claims. Stoltz discloses a photographic imaging system (sensors, 15a and 15b); a micromirror array (DMD, 11) containing an array of micromirrors, each mirror being capable of tilting individually in at least two directions (col. 3, lines 22-45) said micromirror array being positioned with respect to the photographing imaging system so that each mirror of the micromirror array transfers a reflected pixel of the scene to be photographed to the photographing imaging system (sensors, 15a and 15b), and an assembly system (processor, 35) which forms a high resolution image of the scene by mosaicing extracted color values from each reflected pixel from each mirror of the

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micromirror array into a high resolution image of the scene. See column 5, line 47 to column 6, line 11. Stoltz's embodiment shown in Figure 4 shows a system for generating a high resolution image by capturing pixels on two separate sensors. Stoltz's embodiment shown in Figure 15 replaces the sensors (15a and 15b) with color image sensors (51a-51c). Thus, Stoltz discloses forming a high resolution image by mosaicing the extracted color values of each pixel.

Furthermore, it is inherent that the processor (35) of Stoltz forms an image by mosaicing since each pixel is captured separately. Different tilt positions are used to direct light to the two different image sensors (col. 5, lines 53-55). Furthermore, Stoltz discloses that the mirror can be tilted in the left and right (or up and down). See Figure 2B. Reference numbers 45a, 45b, and 45c, represent the different tilt directions. Therefore, each micromirror is capable of tilting in at least two directions. Since the claim language merely requires the reflection of "different sets of pixels representing locations of the scene", each mirror is only required to reflect different sets of pixels representing locations of the scene. It is clear that each mirror in the embodiment shown in Figure 4, it capable of directing different sets of pixels representing locations of the scene.

16. As for **claim 2**, Stoltz discloses that this arrangement can be used in a still camera or television camera (video camera). Since Stoltz discloses an A/D converter (34), the camera is a digital camera.

17. **Claim 3** is considered a method claim corresponding to claim 1. Please see the discussion of claim 1 above.

18. With regard to **claims 4 and 13**, since the system is capable of constructing an image, it is inherent that the extracted color values are correlated to corresponding locations of the scene.

See column 5, lines 14-22.

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19. As for *claims 7 and 8*, the DMD device of Stoltz can be interpreted to be both a micro-electromechanical array and a micro-optical-electromechanical array.

20. Regarding *claims 9 and 10*, Stoltz discloses that this arrangement can be used in a still camera or television camera (video camera). See column 2, line 60. Since Stoltz discloses an A/D converter (34), the camera is a digital camera.

21. With regard to *claim 11*, Stoltz discloses that each micromirror is individually controllable. See column 4, lines 10-12.

22. As for *claim 12, 19, and 20*, as mentioned above in the discussion of claim 1, Stoltz discloses an embodiment in which R, G, and B colors are captured. See Figure 4.

23. Regarding *claim 14*, as mentioned above in the discussion of claim 1, Stoltz discloses that each micromirror is moved in at least two different tilt directions.

24. With regard to *claim 15*, Stoltz discloses capturing a series of frames for moving images. Inherently, these image would have to be captured as some type of frame rate.

25. As for *claim 16*, Stoltz discloses that a 640X480 pixel image can be captured in 0.2 seconds. See column 5, lines 60-66.

26. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after



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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN M. VILLECCO whose telephone number is (571)272-7319. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOHN M. VILLECCO/

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Primary Examiner, Art Unit 2622

February 3, 2009